International Journal of Applied Engineering Research 2015 vol.10 N24, pages 45022-45026

Application of neural networks for the diagnosis of depth sucker rod pumps

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Abstract

© Research India Publications. One of the most common methods of artificial oil extraction is the use of depth sucker rod pumps. An effective way to diagnose the state of deep pumping equipment is to measure changes of load on the rod of a pumping unit and the analysis of a dynamometer. This method allows you to monitor the status of a depth sucker rod pump without its lifting to the surface. The drawing up of a conclusion according to the dynamometer - is the most important stage of the whole study, as on the basis of it the nature of an underground repair is determined. Considering the high cost of hoisting operations, an incorrectly assigned repair or untimely assigned repair is a very expensive one. Neural networks are often used in the problems of pattern recognition. We propose a block diagram of an automated fault detection system for a depth sucker rod pump and the algorithm of its operation. In order to test the possibility of neural network use the software was developed based with perceptron and Hamming neural networ use. The programs based on neural networks successfully coped with the task of pattern recognition. The use of an automated system based on neural networks will allow us to respond promptly to the changes in the underground equipment operation, and to take timely decisions on repair or its replacement and, therefore, to improve the efficiency of oil production process.

Keywords

Depth sucker rod pump, Dynamogram, Hamming neural network, Perceptron